



# ISS Onboard Virtual Reality Trainer (VRT)

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# Outline

- Astronaut EVA training – past and present
- NASA JSC VRLab
- Why bring VR onboard ISS?
- VR Trainer design and implementation
- Future uses / improvements



# Astronaut EVA Training

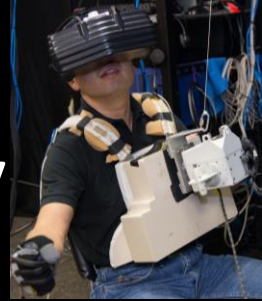
- Space Shuttle
  - Crew assigned ~2 yr prior to flight
  - EVA crew selected near beginning of training
  - NBL training: task-specific
- ISS
  - Crew assigned ~2.5 yr prior to flight
  - EVAs scheduled as needed
  - NBL training: generic



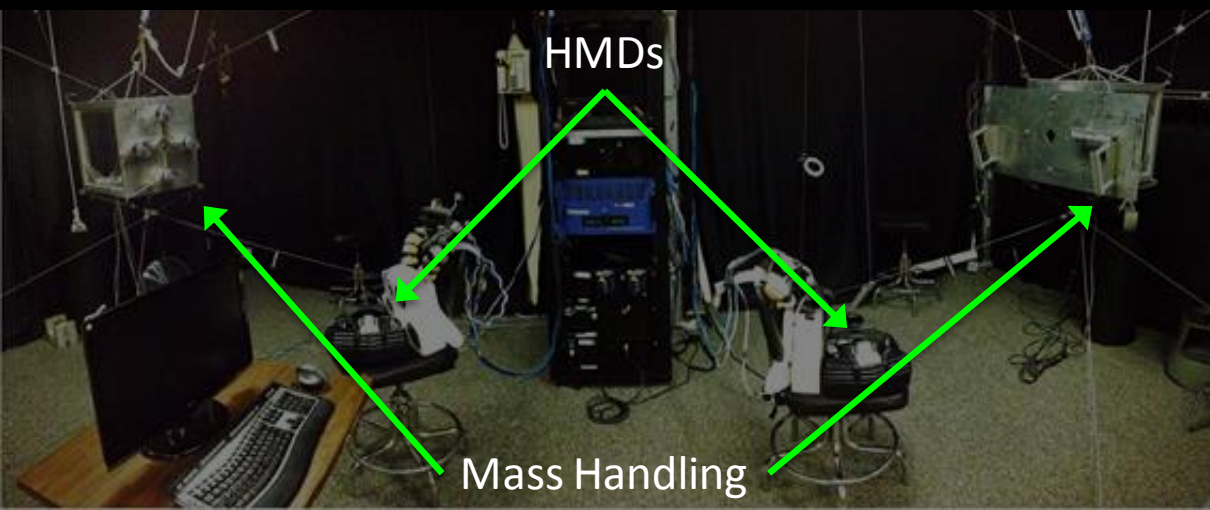




# Training Astronauts - Virtually

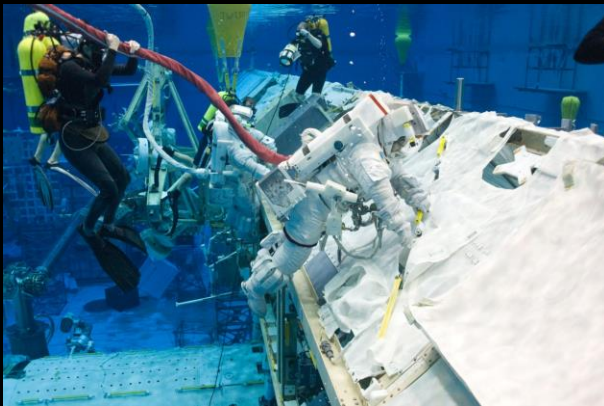


- JSC VRLab established in 1990s, used for:
  - EVA Procedure Development
  - Simplified Aid for EVA Rescue (SAFER)
  - Robotics workstation training
  - Mass Handling



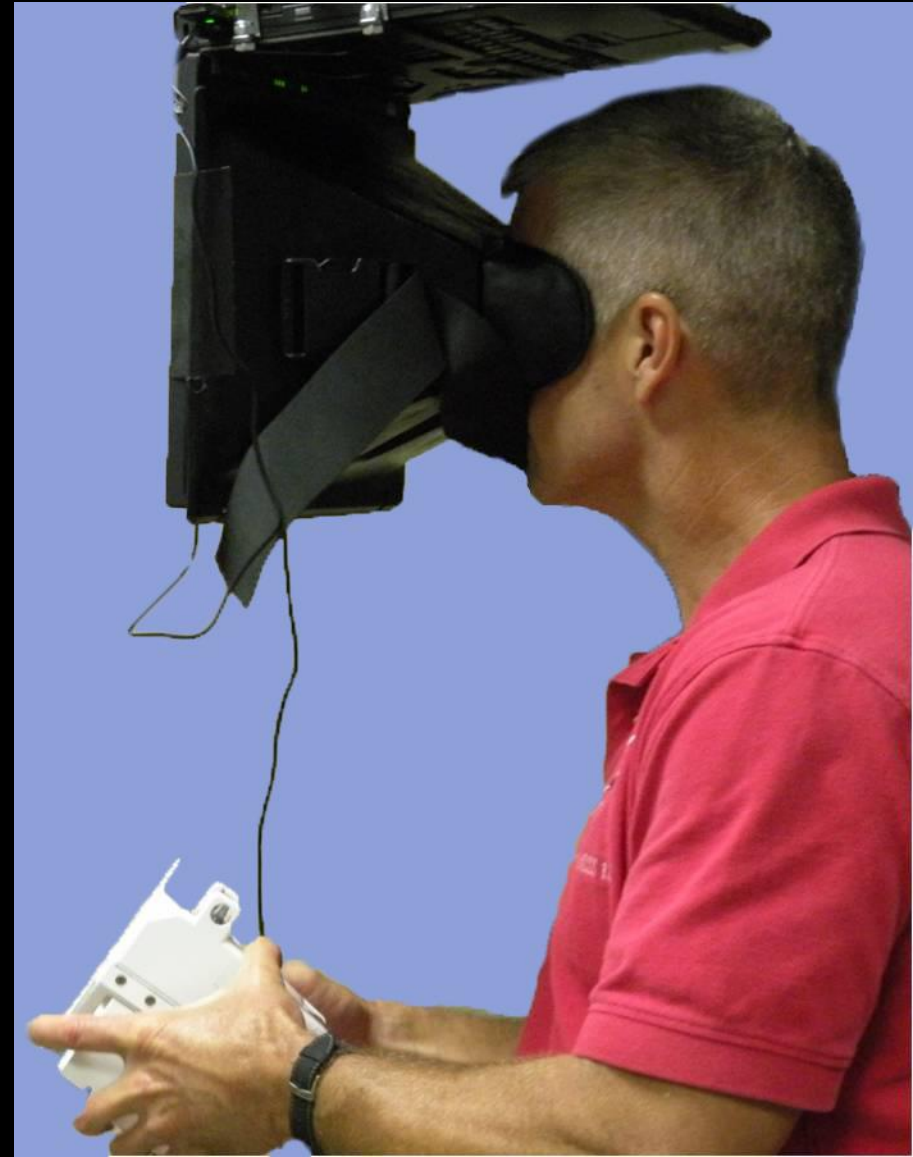
# Why bring VR to ISS?

- For ISS training, astronauts have:
  - Less task-specific crew training
  - Longer time between training and actual EVA
- VR provides a 3D immersive environment to:
  - Reinforce existing training (proficiency/review)
  - Provide unique “views” of hardware/worksites not previously seen



# Designing the VR Trainer (VRT)

- Requirements:
  - Provide a 3D immersive experience on ISS
  - Utilize existing hardware/software to minimize certification time
- Design:
  - Provide a hood with integrated optics to attach to existing ISS laptops





# VRT Components



# Using the VRT

- Launched summer 2013 and has been used for training/proficiency prior to every US EVA since
  - Planned EVAs:
    - EVA 22, 23, 27, 28, 29, 30, 31
  - Contingency EVAs:
    - EVA 24, 25, 26





# Future Applications

- Vision testing
- Updated hardware
- Crew psychological support
- ???



# Reference

- 2014 JSC Research and Tech Report (p. 233): [https://www.nasa.gov/sites/default/files/files/2014\\_Final\\_Rev1.pdf](https://www.nasa.gov/sites/default/files/files/2014_Final_Rev1.pdf)  
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- Follow the VRLab: @vr\_doug

